

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



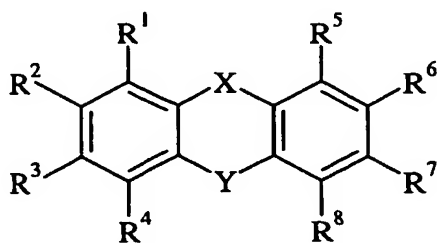
(43) International Publication Date
1 April 2004 (01.04.2004)

PCT

(10) International Publication Number
WO 2004/026030 A3

- (51) International Patent Classification⁷: **A61N 43/22**,
43/40, 43/42, 43/46, 43/48, 43/60, 43/72, 43/84
- (21) International Application Number:
PCT/US2003/028791
- (22) International Filing Date:
12 September 2003 (12.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/411,926 18 September 2002 (18.09.2002) US
- (71) Applicant (for all designated States except US): **FMC CORPORATION** [US/US]; 1735 Market Street, Philadelphia, PA 19103 (US).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **ARGENTINE, Joseph, A.** [US/US]; 7 Lavenham Court, Tabernacle, NJ 08088 (US). **SCHULER, Franz** [CH/CH]; Chrischonastr. 38, CH-4058 Basel (CH). **DIXSON, John, A.** [US/US]; 135 Canterbury Court, Newtown, PA 18940 (US). **CRAWFORD, Scott, D.** [US/US]; 7 Dominion Drive, Jackson, NJ 08527 (US). **COHEN, Daniel, H.** [US/US]; 39 Vandeventer Avenue, Princeton, NJ 08542 (US). **ROWLEY, Elizabeth, G.** [US/US]; 27 Pointer Place, Kendall Park, NJ 08824 (US). **SEHGEL, Saroj** [US/US]; 21 Park Hill Terrace, Princeton Junction, NJ 08558 (US).
- (74) Agents: **SHEEHAN, John, M. et al.**; FMC Corporation, 1735 Market Street, Philadelphia, PA 19103 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:
3 June 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: INSECTICIDAL TRICYCLIC DERIVATIVES



(I)

(57) Abstract: It has now been found that certain tricyclic derivatives have provided unexpected insecticidal activity. These compounds are represented by formula I: wherein R¹ through R⁸, inclusively, and X and Y are fully described. Compositions comprising an insecticidally effective amount of at least one compound of formula I, and optionally, an effective amount of at least one of a second compound, with at least one insecticidally compatible carrier are also disclosed; along with methods of controlling insects comprising applying said compositions to the locus where insects are present or are expected to be present.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/28791

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61N 43/22, 43/40, 43/42, 43/46, 43/48, 43/60, 43/72, 43/84
US CL : 504/218, 219, 225, 235, 245, 248, 251,283, 288, 291

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 504/218, 219, 225, 235, 245, 248, 251,283, 288, 291

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CAS ONLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,777,177 A (TRABER et al.) 11 October 1988 (11.10.1988), see entire document; especially claims 1, 2, 4, 5, 7.	1, 2, 6, 7, 11, 12, 16, 17
X, P	WO 03/039255 A1 (BASF AKTIENGESellschaft) 15 May 2003 (15.05.2003), see entire document, especially claims 1-10.	1, 3, 6, 8, 11, 13, 16, 18
X	US 3,351,599 A (PROTIVA et al.) 07 November 1967 (07.11.1967), column 8, claims 1-5.	1, 3, 6, 8
X	US 5,602,124 A (TEHIM et al.) 11 February 1997 (11.02.1997), columns 12-14; columns 15-16, claims 14-17.	1, 5, 6, 10
X	US 4,308,207 A (HUNZIKER et al.) 29 December 1981 (29.12.1981), columns 1-2.	1, 5, 6, 10
X	US 5,538,965 A (TEHIM et al.) 23 July 1996 (23.07.1996), columns 21-28; column 32, claims 22-23.	1, 5, 6, 10
X	Database CAPLUS on STN, AN 1964:447951, WANDER, A.G. '5H-dibenzo[b,e] [1,4]diazepines and 1H-dibenzo[b,f] [1,4]thiazepines,' abstract, FR CAM51, 04 May 1964 (04.05.1964), see entire abstract.	1, 5, 6, 10
X	US 5,436,333 A (VENKATESAN et al.) 25 July 1995 (25.07.1995), column 2.	1, 4, 6, 9



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

22 November 2003 (22.11.2003)

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Date of mailing of the international search report

23 APR 2004

Authorized officer

Evelyn Huang

Telephone No. 703-308-1235

Form PCT/ISA/210 (second sheet) (July 1998)

BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/28791

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US03/28791

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3,357,998 A (CUSIC et al) 12 December 1967 (12.12.1967), column 1.	1,4,6,9,11,14,16,19

INTERNATIONAL SEARCH REPORT

PCT/US03/28792

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 2, 7, 12, 17 and claims 1, 6, 11, 16 in part, drawn to an insecticidal composition comprising a compound as defined in claim 2, and its method of use.

Group II, claim(s) 3, 8, 13, 18, and claims 1, 6, 11, 16 in part, drawn to an insecticidal composition comprising a compound as defined in claim 3, and its method of use.

Group III, claim(s) 4, 9, 14, 19, and claims 1, 6, 11, 16 in part, drawn to an insecticidal composition comprising a compound as defined in claim 4, and its method of use.

Group IV, claim(s) 5, 10, 16, 15, 20, and claims 1, 6, 11, 16 in part, drawn to an insecticidal composition comprising a compound as defined in claim 5, and its method of use.

Group V, claim(s) claims 1, 6, 11, 16 in part, drawn to an insecticidal composition comprising a compound not included in Groups I-IV, and its method of use.

The inventions listed as Groups I to V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the compounds in the compositions of Groups I to V are structurally distinct from one another in that they do not have a common tricyclic core structure and they have been shown to have utilities as pharmaceuticals other than as insecticides.